Metal Oxide Catalyst TMO

Metal Oxide Catalyst is designed for catalytic combustion of organic compounds, in particular those containing oxygen and nitrogen.

Catalytic oxidation of organic compounds containing oxygen like alcohols, ketones, esters or organic acids leads to the formation of $\text{CO}_2$, $\text{H}_2\text{O}$ and products of partial oxidation. For example, acetaldehyde may appear in the products of ethanol oxidation:

$$\text{C}_2\text{H}_5\text{OH} + \text{O}_2 \rightarrow \text{CO}_2 + \text{H}_2\text{O}$$

$$\text{CO}_2 + \text{H}_2\text{O} \rightarrow \text{CH}_3\text{CHO}$$

Both scientific research and industrial practice have shown that a relatively high ratio of acetaldehyde is formed on the platinum catalyst (reaction 1 and 2 proceed in parallel), whereas the reaction of ethanol oxidation goes mainly according to scheme 1 on the metal oxide catalyst.

Catalytic properties of platinum and metal oxide catalysts in ethanol oxidation are compared in Figure 1.

Catalytic oxidation of the nitrogen-containing compounds leads to the formation of $\text{CO}_2$, $\text{H}_2\text{O}$, $\text{N}_2$, and nitrogen oxides, $\text{NO}_x$ ($\text{NO}$, $\text{NO}_2$).

It is known that platinum catalysts oxidize organic nitrogen to nitrogen oxide with a high reaction field. Harmless molecular nitrogen, $\text{N}_2$, is formed on TMO catalyst (Fig. 2).
Application

Industrial processes in which organic compounds, particularly those which contain oxygen and/or nitrogen are emitted to the atmosphere.

Attention: organic compounds should not contain phosphorus or sulphur. Catalyst is insensitive to chlorine containing compounds at low concentration.

The choice of a catalyst to a Niven catalytic combustion installation depends on individual process conditions.

Technical data

- content of active phase: 5%
- catalyst support: γ- Al₂O₃ balls of 4 – 8mm lub 2 – 5mm diameter
- bulk density: 760 – 840kg/m³ lub 660 – 720kg/m³
- G.H.S.V.: 2500 – 10000h⁻¹
- working temperature: 300 - 500°C depending on G.H.S.V.
- conversion of organic compounds: 90 – 98% (depending on impurity type)
- maximum working temperature: 550°C
- guaranteed time of work: 1 – 2 years (depending on process conditions)

Limitations

- Exhaust gases should not contain mechanical impurities settling on the surface of catalyst balls like dusts, aerosols, pigments, metal particles
- continuous work of the catalyst at the temperature over 550°C is not recommended

Warranty

- warranty is issued after obtaining the precise specification of all organic substances present in purified gases

Terms of delivery

- time of delivery of a batch of the catalyst up to 2000 kg – 30 days after the payment of 30% of the price of the ordered catalyst
- orders with the specification of the payment conditions should be send to:

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